

# MACHITA MOCKS 2024

## MATHEMATICS SCORING GRID

### ITEM ONE

(a)

2	40	30
5	20	15
2	4	3
2	2	3
3	1	3
	1	1

I = 1

$$\text{H.C.F} = 2 \times 5 = 10$$

m = 1

The teacher can form 10 groups from 40 girls and 30 boys.

A = 1

$$\text{Girls} = \frac{40}{10} = 4$$

$$\text{Boys} = \frac{30}{10} = 3$$

I = 1

m = 1

Each group will have 4 girls and 3 boys.

A = 1

(b)

$$\frac{25}{40} \times 100 = 62.5 \approx 63\%$$

I = 1

He should tell parent that the learner got 63%.

m = 1

A = 1

(c)

Amount paid by each = Ugx. 50000.

Amount planned for transport

$$\text{for each} = \frac{2}{5} \times 50,000 = \text{Ugx. } 20,000 \quad I = 1$$

m = 1

Total transport for 30 students

$$= 20,000 \times 30$$

I = 1

$$= \text{Ugx. } 600,000$$

m = 1

Yes he will afford the transport company because the amount it asked for is what learner's paid for transport

A = 1

(d)

1200 three

$$(1 \times 3) + (2 \times 3^2) + (0 \times 3^1) + (0 \times 3^0)$$

$$(1 \times 27) + (2 \times 9)$$

45 ten

I = 1

I = 1

m = 2

∴ Mark won the QUIZ

A = 1

T = Identification

M = Manipulation

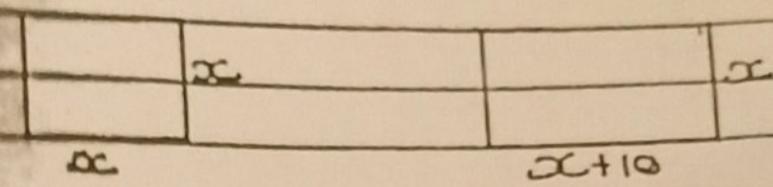
A = Application

ITEM TWO

(a)

Current

New



Let  $x$  = L and W of  
current square  
base

$F=1$

$$\text{Current} = x \times x$$

$$\text{Area} = x^2$$

$F=1$

$$\text{New Area} = 3x^2$$

$$\begin{aligned}\text{Area} &= x(x+10) \\ &= x^2 + 10x\end{aligned}$$

$F=1$

$m=1$

$$\therefore x^2 + 10x = 3x^2$$

$$3x^2 - x^2 - 10x = 0$$

$$2x^2 - 10x = 0$$

$$2x(x-5) = 0$$

$m=1$

$$2x=0 \quad \text{or} \quad x-5=0$$

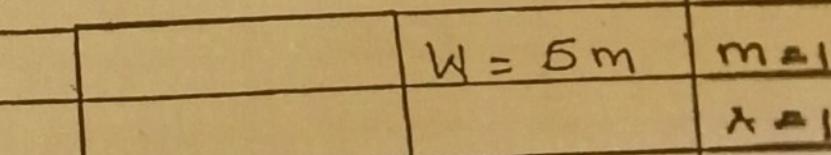
$$x=0$$

$$x=5$$

$m=1$

Taking the Land W of  
current square base to  
be 5m.

Sketch of the new base



$$L = x+10$$

$$= 5+10$$

$$= 5m$$

m = manipulation  
A = Application

(b)

Let  $x$  = Number of kuroilers  
 $y$  = Number of broilers

F=1

$$\text{Sales} = 30,000x + 25,000y$$

F=1

$$x+y \leq 500$$

F=1

$$x \leq 300$$

F=1

$$x > y+100$$

F=1

$$x > 0$$

F=1

$$y > 0$$

linear equations

$$x+y = 500$$

$$x = 300$$

F=1

$$x = y+100$$

$$x = 0$$

$$y = 0$$

Coordinates

$$x+y = 500$$

	x	500	0	m=1
	y	0	500	

$$x = y+100$$

	x	100	300	m=1
	y	0	400	

Optimal Points

Sales

250, 190

12,250,000

m=1

220, 220

12,100,000

∴ He can have 250 kuroilers and 190 broilers to maximise sales.



### ITEM THREE

(a)

Let :- M = mathematics

C = chemistry.

TABLE DIAGRAM REPRESENTING THE DATA. P=1

	IM	$\frac{1}{4}$	$\left(\frac{1}{4} \times \frac{3}{5}\right) = \frac{3}{20}$	P=1
$S = 5$	BC	$\frac{3}{4}$	$\left(\frac{2}{5} \times \frac{3}{4}\right) = \frac{3}{10}$	P=1
2M		$\frac{2}{5}$	$\left(\frac{3}{5} \times \frac{2}{4}\right) = \frac{3}{10}$	P=1
3C		$\frac{3}{5}$	$\left(\frac{3}{5} \times \frac{2}{4}\right) = \frac{3}{10}$	P=1
	2M	$\frac{1}{4}$	$\left(\frac{3}{5} \times \frac{2}{4}\right) = \frac{3}{10}$	P=1

$$\text{Probability} = \frac{3}{10} + \frac{3}{10} + \frac{3}{10} = 0.9 \quad A=2$$

(b)

Let :- M=mathematics, P=physics, C=chemistry

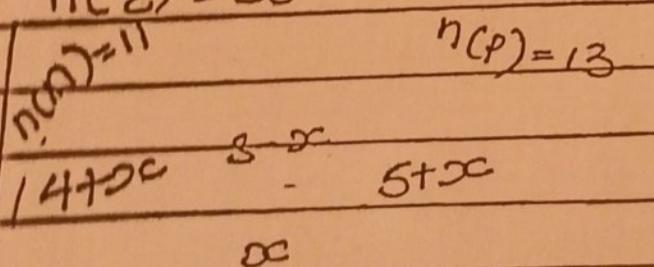
$n(C\bar{E})=30$ ,  $n(CM)=11$ ,  $n(CP)=13$ ,  $n(CC)=17$ ,

$n(Mn\bar{P})=3$ ,  $n(Pn\bar{C})=5$ ,  $n(Mn\bar{n}C)=4$ ,

$n(\bar{M}n\bar{P}n\bar{C})=x$ .

VENN-DIAGRAM. REPRESENTING THE P=1  
DATA.

$$n(C\bar{E}) = 30$$



$$8+x$$

$$n(C) = 17$$

-6-

$$4x + 3 - x + 5x + 4x + x + 5 - x + 8x = 30$$

$$4+3+5+4+5+8+x - x - x - x + x = 30$$

$$29 + x = 30$$

$$x = 1$$

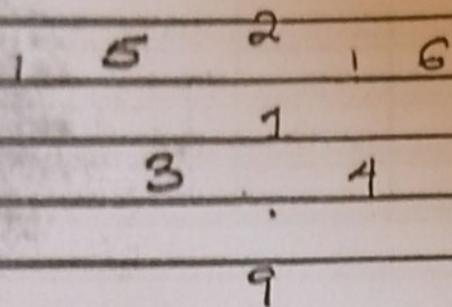
A = 1

$$n(\Sigma) = 30$$

$$n(M) = 11$$

$$n(P) = 13$$

P = 1



P = 1

P = 1

$$n(\Sigma) = 17$$

$$\text{Probability} = \frac{3+2+1+4}{30}$$

$$= \frac{10}{30}$$

$$= 0.3$$

A = 1

A = 1

A = 1

Conclusion :-

No he will choose only one since according to the teacher's recommendations the probability that he can do all is less than 0.5

AP < 1

## ITEM FOUR

9 (i)  
A FREQUENCY TABLE REPRESENTING  
THE DATA.

Score (%)	Tallys	No. of sides	C.F	Class boundaries
10 - 49		7	7	39.5 - 49.5
50 - 59		8	15	49.5 - 59.5
60 - 69		9	24	59.5 - 69.5
70 - 79		11	35	69.5 - 79.5
80 - 89		7	42	79.5 - 89.5
90 - 99		8	50	89.5 - 99.5
		50		

$$50^{\text{th}} \text{ Percentile} = \frac{50 \times 50}{100} = 25$$

Position

$$L_i = 69.5$$

$$C_{fb} = 24$$

$$F_{50} = 11$$

$$C_w = 10$$

$$50^{\text{th}} \text{ Percentile} = 69.5 + \left( \frac{25 - 24}{11} \right) 10$$

score

$$= 70.4 \approx 70\%$$

She will set a pass mark of 70%.

(ii)

$$\text{Mode} = 69.5 + \left( \frac{2}{2+4} \right) 10$$

$$= 72.8 \% = 73 \%$$

∴ The majority scored 73 %

iii

I recommend a score of 75% to be set as passmark because it brings out fairness since it's scored by majority.

Learner can give any other conclusion.

## ITEM FIVE

(a) Let the scale factor be  $x$ .

$$4.5x = 9$$

$$x = \frac{9}{4.5}$$

$$x = 2$$

$$x = 2\text{cm}$$

$$A=1$$

$$M=1$$

$$m=1$$

He can set the magnifier arm at scale factor 2 while standing at a position described by (210)

$$A_p=2$$

(b) Hire purchase he wants to use :-

$$\text{cost} = 8000 \times 3500$$

$$A=1$$

$$= 10,500,000 \text{ uganda shillings.}$$

$$m=1$$

$$\text{deposit} = \frac{60}{100} \times 10,500,000$$

$$A=1$$

$$= \text{Ugx. } 6,300,000$$

$$m=1$$

$$\text{Installment amount} = 4 \times 1,050,000$$

$$A=1$$

$$= 4,200,000 \text{ uganda shillings}$$

$$m=1$$

$$\text{Total amount to be paid} = \text{Ugx. } 10,500,000$$

$$m=1$$

Amount to be paid on cash

$$\frac{100-10}{100} \times 10,500,000$$

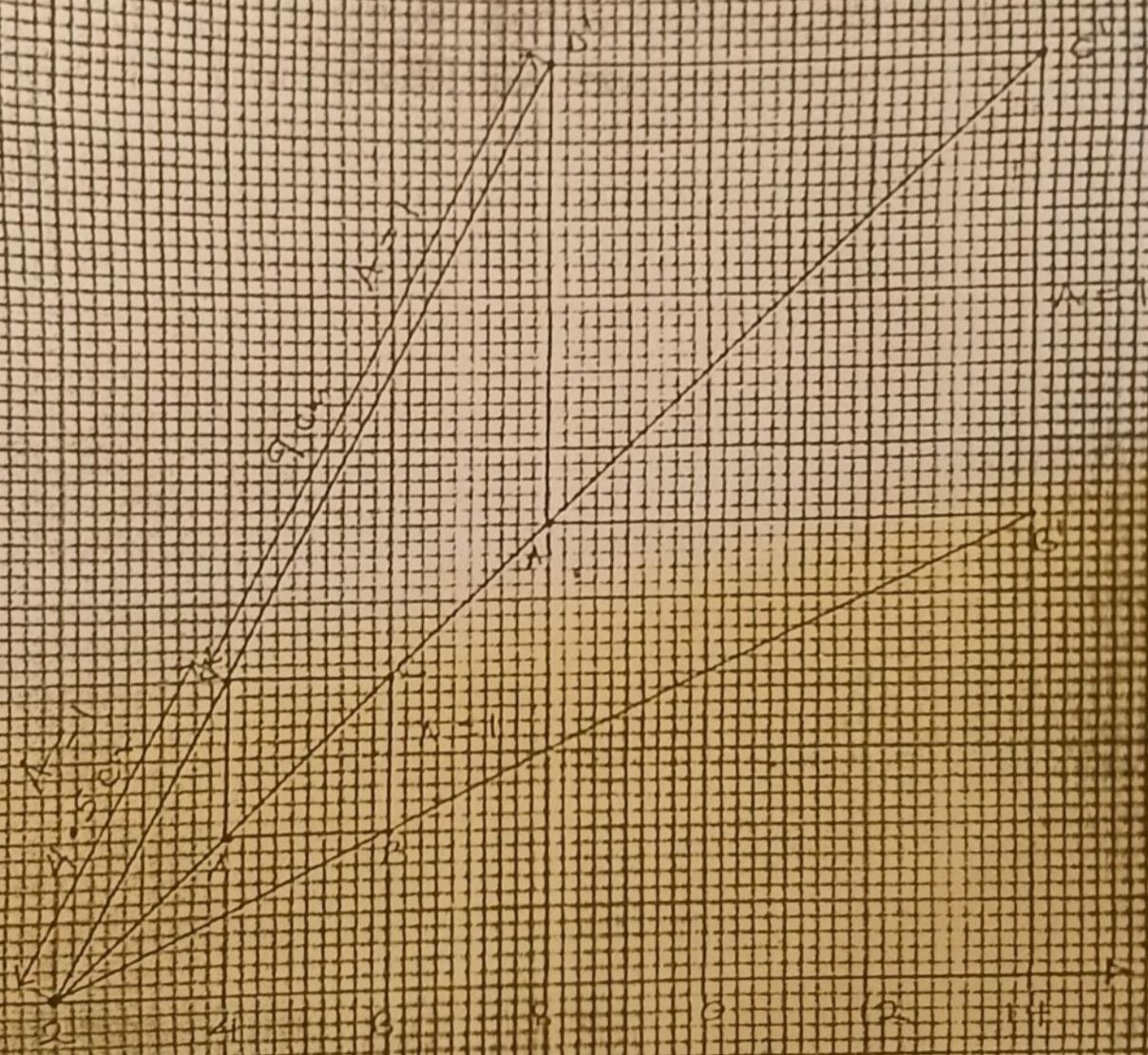
$$A=1$$

$$\text{Ugx. } 9,450,000$$

$$m=1$$

Yes I advice him to pay according to doctor's advice because when he does so, he will save Ugx. 1,050,000

$$A_p=2$$



# ITEM SIX

(a)

Music box faces = 10cm by 10cm

box = 6 faces

$$\text{surface area} = 6 \times 10^2$$

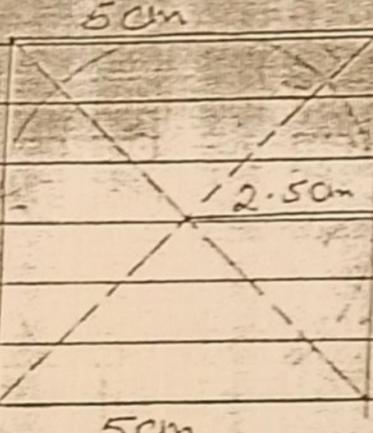
$$= 6 \times 10^2$$

$$= 600 \text{ cm}^2$$

He will need a board of 600 square centimeters

scale 1 cm = 2 cm

$$\begin{pmatrix} 10 \\ 2 \end{pmatrix} \text{ cm} = 10 \text{ cm}$$



$$1 \text{ cm} = 2 \text{ cm}$$

$$2.5 \text{ cm} = 2.5 \times 2$$

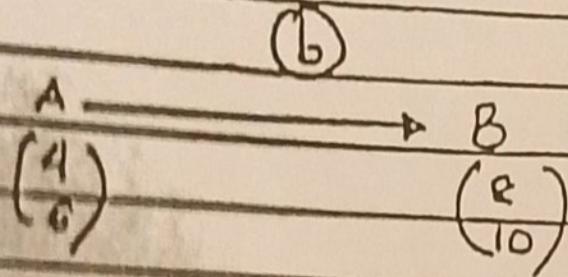
$$= 5 \text{ cm}$$

∴ size of

$$\text{circular board} = \pi r^2$$

$$\text{to cut out} = 3.14 \times 5$$

$$= 15.7 \text{ cm}^2$$



$$T = \begin{pmatrix} 8 \\ 10 \end{pmatrix} - \begin{pmatrix} 4 \\ 6 \end{pmatrix}$$

$$= \begin{pmatrix} 4 \\ 4 \end{pmatrix}$$

$\Delta = 1$

$m = 1$

$\therefore$  He can instruct him to move it  
4cm right and 4cm up.

$AP = 2$

(c)

$$\text{Taxable income} = 600,000 - 120,000$$

$$= \text{UGX. } 480,000$$

$A = 1$

$m = 1$

Income tax.

$$\frac{0}{100} \times 200,000 = 0$$

$$\frac{10}{100} \times 100,000 = 10,000$$

$$\frac{15}{100} \times 100,000 = 15000$$

$$\frac{20}{100} \times 80,000 = 16000$$

$$\therefore \text{Income tax} = \text{UGX. } 41,000$$

$$\text{Net pay} = 600,000 - 41,000$$

$$= \text{UGX. } 559,000$$

$\therefore$  He will budget for 559,000.